

1 **What is claimed is:**

2 1. A reversible ratchet-type wrench comprising:

3 a handle;

4 a head extended from the handle and including a hole, a web being defined between the
5 handle and the head, a cavity being defined in the web and communicated with the hole, the
6 web further including a compartment having a first end communicated with the cavity and a
7 second end communicated with outside, thereby leaving a bridge in the web;

8 a drive member rotatably mounted in the hole of the head, the drive member including a
9 plurality of teeth formed on an outer periphery thereof;

10 a pawl mounted in the cavity and including a first side with a plurality of ratchet teeth
11 for releasably engaging with the teeth of the drive member;

12 a switch member including a turn-piece for manual operation and an actuating plate
13 extended from the turn-piece and rotatably received in the second end of the compartment of
14 the web, the switch member being switchable between two positions for changing ratcheting
15 direction of the drive member; and

16 a biasing means mounted in the cavity and between the pawl and the actuating plate for
17 biasing the ratchet teeth of the pawl to engage with the teeth of the drive member.

18 2. The reversible ratchet-type wrench as claimed in claim 1, wherein an inner periphery
19 defining the hole of the head includes a first annular groove, and wherein the outer periphery
20 of the drive member includes a second annular groove, further comprising a C-clip received in
21 the first annular groove and the second annular groove, thereby rotatably retaining the drive
22 member in the head.

23 3. The reversible ratchet-type wrench as claimed in claim 1, wherein the biasing means
24 includes an elastic element and a peg, the pawl further including a second side with a recess,
25 the peg having a first end movably received in the recess of the pawl and a second end, the
26 elastic element biasing the second end of the peg for exerting a force to the peg toward the
27 pawl, thereby urging the ratchet teeth of the pawl to engage with the teeth of the gear wheel.

1 4. The reversible ratchet-type wrench as claimed in claim 3, wherein the actuating plate of the
2 switch member includes a receptacle that faces the cavity, the elastic element including a first
3 end received in the receptacle and a second end outside the receptacle and configured to be
4 attached to the actuating plate, the second end of the peg being received in the elastic element,
5 the first end of the elastic element being configured to bias the second end of the peg toward
6 the recess of the pawl.

7 5. The reversible ratchet-type wrench as claimed in claim 4, wherein the drive member is a
8 gear wheel including an inner periphery adapted to drive a fastener.

9 6. The reversible ratchet-type wrench as claimed in claim 4, wherein the drive member
10 includes a drive column for releasably engaging with a socket.

11 7. The reversible ratchet-type wrench as claimed in claim 6, wherein the head includes an end
12 wall with an opening, and wherein the drive member includes a stub rotatably received in the
13 opening.

14 8. The reversible ratchet-type wrench as claimed in claim 3, wherein the actuating plate of the
15 switch member includes a first receptacle that faces the cavity, the first receptacle having a
16 first end wall, the second end of the peg being received in the first receptacle and including a
17 second receptacle with a second end wall, the elastic element having two ends that are
18 attached between the first end wall and the second end wall.

19 9. The reversible ratchet-type wrench as claimed in claim 8, wherein the drive member is a
20 gear wheel including an inner periphery adapted to drive a fastener.

21 10. The reversible ratchet-type wrench as claimed in claim 9, wherein the drive member
22 includes a drive column for releasably engaging with a socket.

23 11. The reversible ratchet-type wrench as claimed in claim 10, wherein the head includes an
24 end wall with an opening, and wherein the drive member includes a stub rotatably received in
25 the opening.

26 12. The reversible ratchet-type wrench as claimed in claim 1, wherein the drive member is a
27 gear wheel including an inner periphery adapted to drive a fastener.

1 45. The reversible ratchet-type wrench as claimed in claim 1, wherein the drive member
2 includes a drive column for releasably engaging with a socket.

3 *Pub By* 14. The reversible ratchet-type wrench as claimed in claim 13, wherein the head includes an
4 end wall with an opening, and wherein the drive member includes a stub rotatably received in
5 the opening.

6 15. A reversible ratchet-type wrench comprising:

7 a handle;

8 a head extended from the handle and including a hole, a web being defined between the
9 handle and the head, a cavity being defined in the web and communicated with the hole, the
10 web further including a compartment communicated with the cavity;

11 a drive member rotatably mounted in the hole of the head, the drive member including a
12 plurality of teeth formed on an outer periphery thereof;

13 a pawl mounted in the cavity and including a first side with a plurality of ratchet teeth
14 for releasably engaging with the teeth of the drive member, the pawl further including a
15 second side with a recess;

16 a switch member including a turn-piece for manual operation and an actuating plate
17 extended from the turn-piece and rotatably received in the compartment of the web, the switch
18 member being switchable between two positions for changing ratcheting direction of the drive
19 member; and

20 a biasing means mounted in the cavity and between the recess of the pawl and the
21 actuating plate for biasing the ratchet teeth of the pawl to engage with the teeth of the drive
22 member, the biasing means including an elastic element and a peg, the peg having a first end
23 movably received in the recess of the pawl and a second end, the elastic element biasing the
24 second end of the peg for exerting a force to the peg toward the pawl, thereby urging the
25 ratchet teeth of the pawl to engage with the teeth of the gear wheel;

26 the actuating plate of the switch member including a receptacle that faces the cavity, the
27 elastic element including a first end received in the receptacle and a second end outside the

1 receptacle and configured to be attached to the actuating plate, the second end of the peg being
2 received in the elastic element, the first end of the elastic element being configured to bias the
3 second end of the peg toward the recess of the pawl.

4 ~~16.~~ ^{46/11} The reversible ratchet-type wrench as claimed in claim ~~15~~, wherein the drive member is a
5 gear wheel including an inner periphery adapted to drive a fastener.

6 17. The reversible ratchet-type wrench as claimed in claim 15, wherein the drive member
7 includes a drive column for releasably engaging with a socket.

8 ~~18.~~ ^{46/11} The reversible ratchet-type wrench as claimed in claim ~~17~~, wherein the head includes an
9 end wall with an opening, and wherein the drive member includes a stub rotatably received in
10 the opening.

11 ~~19.~~ ^{46/11} The reversible ratchet-type wrench as claimed in claim ~~15~~, wherein an inner periphery
12 defining the hole of the head includes a first annular groove, and wherein the outer periphery
13 of the drive member includes a second annular groove, further comprising a C-clip received in
14 the first annular groove and the second annular groove, thereby rotatably retaining the drive
15 member in the head.

16 ~~20.~~ ^{46/11} The reversible ratchet-type wrench as claimed in claim 15, wherein the compartment of the
17 web has a first end communicated with the cavity and a second end communicated with
18 outside, thereby leaving a bridge in the web.

19 ~~21.~~ ^{46/11} A reversible ratchet-type wrench comprising:

20 a handle;
21 a head extended from the handle and including a hole, a web being defined between the
22 handle and the head, a cavity being defined in the web and communicated with the hole, the
23 web further including a compartment communicated with the cavity;
24 a drive member rotatably mounted in the hole of the head, the drive member including a
25 plurality of teeth formed on an outer periphery thereof;

1 a pawl mounted in the cavity and including a first side with a plurality of ratchet teeth
2 for releasably engaging with the teeth of the drive member, the pawl further including a
3 second side with a recess;

4 a switch member including a turn-piece for manual operation and an actuating plate
5 extended from the turn-piece and rotatably received in the compartment of the web, the switch
6 member being switchable between two positions for changing ratcheting direction of the drive
7 member; and

8 a biasing means mounted in the cavity and between the recess of the pawl and the
9 actuating plate for biasing the ratchet teeth of the pawl to engage with the teeth of the drive
10 member, the biasing means including an elastic element and a peg, the peg having a first end
11 movably received in the recess of the pawl and a second end, the elastic element biasing the
12 second end of the peg for exerting a force to the peg toward the pawl, thereby urging the
13 ratchet teeth of the pawl to engage with the teeth of the gear wheel;

14 the actuating plate of the switch member including a first receptacle that faces the cavity,
15 the first receptacle having a first end wall, the second end of the peg being received in the first
16 receptacle and including a second receptacle with a second end wall, the elastic element
17 having two ends that are attached between the first end wall and the second end wall.

18 ¹⁸ ~~22~~ 22. The reversible ratchet-type wrench as claimed in claim ¹⁷ ~~21~~, wherein the drive member is a
19 gear wheel including an inner periphery adapted to drive a fastener.

20 23. The reversible ratchet-type wrench as claimed in claim 21, wherein the drive member
21 includes a drive column for releasably engaging with a socket.

22 ²² ~~21~~ 24. The reversible ratchet-type wrench as claimed in claim 23, wherein the head includes an
23 end wall with an opening, and wherein the drive member includes a stub rotatably received in
24 the opening.

25 ²⁹ ~~25~~ 25. The reversible ratchet-type wrench as claimed in claim ¹⁷ ~~21~~, wherein an inner periphery
26 defining the hole of the head includes a first annular groove, and wherein the outer periphery
27 of the drive member includes a second annular groove, further comprising a C-clip received in

1 the first annular groove and the second annular groove, thereby rotatably retaining the drive
2 member in the head.

3 *Dubois*
4 C7
5 26. The reversible ratchet-type wrench as claimed in claim 21, wherein the compartment of the
6 web has a first end communicated with the cavity and a second end communicated with
7 outside, thereby leaving a bridge in the web.

8 27. A reversible ratchet-type wrench comprising:

9 1 7 a handle;
10 2 a head extended from the handle and including a hole, a web being defined between the
11 3 handle and the head, a cavity being defined in the web and communicated with the hole, the
12 4 web further including a compartment communicated with the cavity;

13 5 a drive member rotatably mounted in the hole of the head, the drive member including a
14 6 plurality of teeth formed on an outer periphery thereof;

15 7 a pawl mounted in the cavity and including a first side with a plurality of ratchet teeth
16 8 for releasably engaging with the teeth of the drive member, the pawl further including a
17 9 second side with a recess;

18 10 a switch member rotatably received in the compartment of the web, the switch member
19 11 being switchable between two positions for changing ratcheting direction of the drive member;
20 12 and

21 13 a biasing means mounted in the cavity and having a first end slidably received in the
22 14 recess of the pawl and a second end attached to the switch member for biasing the ratchet teeth
23 15 of the pawl to engage with the teeth of the drive member.

24 16 28. The reversible ratchet-type wrench as claimed in claim 27, wherein an inner periphery
25 17 defining the hole of the head includes a first annular groove, and wherein the outer periphery
26 18 of the drive member includes a second annular groove, further comprising a C-clip received in
19 the first annular groove and the second annular groove, thereby rotatably retaining the drive
20 member in the head.

1 29. The reversible ratchet-type wrench as claimed in claim 27, wherein the biasing means
2 includes an elastic element and a peg, the peg having a first end movably received in the
3 recess of the pawl and a second end the elastic element biasing the second end of the peg for
4 exerting a force to the peg toward the pawl, thereby urging the ratchet teeth of the pawl to
5 engage with the teeth of the gear wheel.

6 ~~sub 3~~ 30. The reversible ratchet-type wrench as claimed in claim 29, wherein the switch member
7 includes a turn-piece for manual operation and an actuating plate extended from the turn-piece
8 and rotatably received in the compartment of the web, the actuating plate of the switch
9 member includes a receptacle that faces the cavity, the elastic element including a first end
10 received in the receptacle and a second end outside the receptacle and configured to be
11 attached to the actuating plate, the second end of the peg being received in the elastic element,
12 the first end of the elastic element being configured to bias the second end of the peg toward
13 the recess of the pawl.

14 ~~25~~ 31. The reversible ratchet-type wrench as claimed in claim ~~30~~ 24, wherein the drive member is a
15 gear wheel including an inner periphery adapted to drive a fastener.

16 32. The reversible ratchet-type wrench as claimed in claim 30, wherein the drive member
17 includes a drive column for releasably engaging with a socket.

18 *Dub 69* 33. The reversible ratchet-type wrench as claimed in claim 32, wherein the head includes an
19 end wall with an opening, and wherein the drive member includes a stub rotatably received in
20 the opening.

21 ~~23~~ 34. The reversible ratchet-type wrench as claimed in claim ~~30~~ 24, wherein the actuating plate of
22 the switch member includes a first receptacle that faces the cavity, the first receptacle having a
23 first end wall, the second end of the peg being received in the first receptacle and including a
24 second receptacle with a second end wall, the elastic element having two ends that are
25 attached between the first end wall and the second end wall.

1 35. The reversible ratchet-type wrench as claimed in claim 30, wherein the compartment of the
2 web has a first end communicated with the cavity and a second end communicated with
3 outside, thereby leaving a bridge in the web.

4 29 36. The reversible ratchet-type wrench as claimed in claim 27, wherein the drive member is a
5 gear wheel including an inner periphery adapted to drive a fastener.

6 30 37. The reversible ratchet-type wrench as claimed in claim 27, wherein the drive member
7 includes a drive column for releasably engaging with a socket.

8 31 38. The reversible ratchet-type wrench as claimed in claim 37, wherein the head includes an
9 end wall with an opening, and wherein the drive member includes a stub rotatably received in
10 the opening.

11 39. The reversible ratchet-type wrench as claimed in claim 27, wherein the compartment of the
12 web has a first end communicated with the cavity and a second end communicated with
13 outside, thereby leaving a bridge in the web.

Add B13